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25X1X1. Since these persons had not received their training before the Bolshevist revolution, their technical and scientific knowledge was very inferior to that of the German specialists. Some of the Soviets, it is true, were far above the average, but these were usually the older ones, for instance Genmaior NIKOLAYEV and Lt Col SHORSHIN.

2. The Americans and the Germans both have developed sights which are a satisfactory solution to the problem of aiming from flying aircraft (utilization of the principle of the so-called lagging gyroscope, patented in Germany by Dr. KORTUM). In technical circles, this problem is known as "control process in general" (Steuerungsvorgang allgemein). By controlling the movements of the flying aircraft through a steering gear of specific properties, one is able to either accurately hold the target, following all its movements, or to apply a damping device, which compensates these movements, a process which is naturally connected with a certain lag. The solution found in Germany by Dr. KORTUM, was the mathematical establishment of a differential equation, which represented this problem and which, for the damping factors occurring in the differential equation, brings about a ratio favorable for aiming from aircraft and the ground. This control system was used in all the bomb sights and also in the antiaircraft gun sights.

3. These devices were entirely new to the Soviets and they had the greatest interest in learning them through cooperation with the German experts. It was learned that only one Soviet scientist had realized the theoretical basis of this control system. This knowledge has, however, not spread among the Soviet specialists, a fact which sheds significant light on the conditions prevailing in the Soviet Union. It must be stressed that although the Soviet specialists were willing enough to reach, within the shortest possible time, as they were ordered to do, the level of the German technical knowledge, they did not succeed while they were in the Zeiss Plant. It is improbable

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that they should have reached their aim by now, for the relationship between the Soviet and the German specialists was that of a student to his master.

4. This can be illustrated by the following examples:

a. (1) The Soviet specialists could not understand how a designer of the Zeiss firm (Herr JUNGE) who had not had formal technical training, could make a rough draft of the assembly of complicated data computers with hundreds of details only from his creative imagination, then proceed to construct the set without making any calculations of tolerances and the required degree of precision. They demanded that the most minute parts of all the projected set be extensively examined, in special theoretical studies, as to their permissible tolerances. This had to be done before they would give permission to go ahead with the construction work.

(2) This procedure naturally led to a considerable delay in the solution of the problems. The Soviets completely overlooked the fact that there is no reason for the kinematic calculation of the gears due to the minimum forces to be transmitted in precision mechanics, provided the designer has sufficient experience in this field. They asked all the designers to report on their working methods, source acting as interpreter. At the end of these reports the Soviets were always unsatisfied, asserting that the Germans had withheld the most important information from them which, however, was not the case. This distrust may be explained by the fact that the Soviet engineers, particularly younger ones who had not completed their studies at a technical academy or even a technical school, found it impossible to grasp the intuitive method of the Zeiss specialists.

b. A younger engineer who was told that a torque of a specific magnitude particular to a given shaft might be increased by its transmission to another shaft through an appropriate selection of the gear ratio in the cog wheels used, replied that this well-known fact was in contradiction to the principle of the conservation of energy.

3. A specialist of the Zeiss Firm (Dr. LANGE) established the equations for his sight by calculation with complex numbers. To the Soviets this was an enigma, since the application of this calculus was utterly strange to them, at least in this field, and they were not familiar with it. It was therefore necessary to initiate them into this method of calculation.

4. A striking fact was revealed in the study of the extensive gyroscope tests which had to be performed by Soviet order. The engineer in charge of these tests (Naval Engineer YURIN) had never worked in the field of gyrospopes. Although it can hardly be assumed that there are no gyroscope specialists available in the SU, it seems strange that an engineer should have been detached to JENA and charged with work for which he lacked even a basic knowledge.

5. Ballistic cams play a decisive role in all sights and computers which are connected with ballistics. The manufacture of these ballistic cams has been mechanized to a large degree, special machinery being employed for their production in both Germany and the USA. Soviet Maj DUROV, the engineer in charge of this production, had previously seen these cams produced by hand only. For this reason he and his co-workers, with the help of Zeiss specialists, had to familiarize themselves with the special Zeiss machinery and extensive reports on the preparations of work, the calculations and all the other pertinent problems had to be delivered to them. From the way in which these problems were approached by the Soviets it could be assumed that

ballistic cams of high precision had not been manufactured mechanically in the SU.

6. Mrs. TALANOVA, the Soviet specialist in charge of optical calculations, in her talks with her German counterparts at the Zeiss Plant revealed that in the field of high-quality optical sights also the Soviets were far behind the Germans. For instance, various optical systems occurring in the project, systems which the Soviets obviously did not know how to handle, had to be entirely calculated by the ZEISS specialists.

25X1A [redacted] Comment:

a. German Zeiss specialists have reportedly been deported to MONTOVKA and probably work in a MOSCOW-TUSHINO plant. By securing the cooperation of Dr. KURTUM and his staff of designers the Soviets have gained valuable help in a field where they had been relatively weakest, i.e. in the production of bomb sights, gyroscopic gun sights, periscopes and devices for the remote control of arms.

b. The report indicates that the German specialists are probably faced with the greatest difficulties in the Soviet Union.